

ENGINEERING

Regional Supervisor
Branch of Wildlife Refuges

January 20, 1964

Regional Engineer

RH-R Tewaukon, N.D.
Water Mgmt. Plan

Tewaukon NWR, North Dakota - 1964 Proposed Annual Water Management Plan

We have reviewed the subject report and concur in the proposed management plan.

Reference is made to our last years review reply dated March 29, 1963, at which time we asked the refuge manager to record and send us monthly gauge readings on Form 3-1547. We have not received any of these reports and suggest that the refuge manager please advise us why he has not already done so. We should send the manager a completed sample form 3-1547 from another refuge with our review reply to clearly indicate what we need. He can record more than one set of gauge readings on one sheet, for example: Clouds Lake, Tewaukon, Cutler Marsh, and White Lake readings could all be reported on a single sheet.

We suggest also that the spillway crest or controlling outlet elevation for each pool be indicated on the Impoundment Data sheet on future annual management plan submissions in order to aid our review.

Example: Lake Tewaukon - spillway elevation 1147
 Cutler Marsh - spillway elevation 1149
1) White Lake - spillway elevation 1149
2) Clouds Lake - spillway elevation 1177

- 1) presently controlled by Cutler Marsh
- 2) riprapped outlet elevation

We concur with the manager's plan to establish gauges on Sprague and Mann Lakes in 1964. We are enclosing descriptions and elevations for three benchmarks located near Sprague and Mann Lakes. The descriptions of these benchmarks are as follows:

TBM #30 - 1218.33

Railroad spike in south face of telephone pole, 60 $\frac{1}{2}$ feet southeast from section corner 35, 36, 1, 2. Spike set 1.5 feet above ground

TBM #31 - 1219.08

Railroad spike in west face of power or telephone pole in northwest quarter of section 1 at intersection of railroad and north-south gravel road at southeast end of Sprague Lake. Spike set 2.1 feet above ground in mile post #30.

Myhren
1-20-64

Doeling

1-20

Kowalski
1-20

Wright
1-20

Valley

1/20

ZBM #36 - 1219.21
Railroad spike set 1.8 feet above ground southwest face of a
power pole 65+ feet northeast of section corner 34, 35, 2, 3
T.13N., R.55W.

We wish to compliment the manager on his method of reporting the summary
of 1963 gauge readings, all on successive sheets. This helps us to
compare the various readings more readily.

John D. Unberger

2 extra cc attd.

ELDoeing:CWSstephan:rj

Red 1/15/64

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ANNUAL WATER PROGRAM - TEWAUKON REFUGE

EPA

I. 1963 Water Use Data.

IMPOUNDED DATA (level elev 1147.0)EPA
1-17-64

Lake Tewaukon for Calendar Year 1963

Month	Elevation (feet)	Area (acres)	Capacity (acre-feet)
Jan.	1147.10	1,087	6,910
Feb.	1147.28	1,103	7,110
Mar.	1147.68	1,145	7,650
Apr.	1147.66	1,143	7,620
May	1147.54	1,130	7,460
June	1147.88	1,165	7,910
July	1147.35	1,110	7,210
Aug.	1147.20	1,096	7,030
Sept.	1147.14	1,090	6,960
Oct.	1147.05	1,083	6,850
Nov.	1147.04	1,082	6,840
Dec.	1147.14 (ice)	1,090	6,960

Cutler Marsh for Calendar Year 1963

CUTLER = 1149

Month	Elevation (feet)	Area (acres)	Capacity (acre-feet)
Jan.	1147.20*	100	190
Feb.	1147.28	110	200
Mar.	1148.94	190	437
Apr.	1149.72	235	576
May	1149.62	230	537
June	1149.76	237	586
July	1149.38	219	587
Aug.	1149.30	214	475
Sept.	1149.39	220	489
Oct.	1149.31	215	476
Nov.	1149.42	222	493
Dec.	1149.30	214	475

White Lake for Calendar Year 1963

[CONSTRUCTED BY CONCRETE MASON
1149 ELEV. CONCRETE]

Month	Elevation (feet)	Area (acres)	Capacity (acre-feet)
Jan.	1148.97*	237	502
Feb.	1149.03	240	508
Mar.	1149.31	269	537
Apr	1149.55*	313	573
May	1149.44*	284	550
June	1149.70	333	588
July	1149.40	280	546
Aug.	1149.30	268	536
Sept.	1149.21	258	526
Oct.	1149.03	240	508
Nov.	1148.98	238	502
Dec.	1149.22 (ice)	259	526

Month	Clouds Lake for Calendar Year 1963			Elev. 1177.0
	Elevation (feet)	Area (acres)	Capacity (acre-feet)	
Jan.	1176.75	127	531	
Feb.	1176.80*	128	538	
Mar.	1177.05	130	582	
Apr.	1177.65*	137	667	
May	1177.45*	135	639	
June	1177.68	139	700	
July	1177.40	134	632	
Aug.	1177.08	131	567	
Sept.	1176.77	128	514	
Oct.	1176.52	125	510	
Nov.	1176.38	124	492	
Dec.	1176.72 (ice)	127	537	

* = Estimated

Summary of 1963 Water Program

General.

The water conditions on the refuge were nearly as good as a year ago, and considerably better than the six years preceding 1962. Rainfall for the year was 2.12 inches below normal, but above normal precipitation came during the water critical month of May. Run-off from the Wild Rice River continued to replenish some of the refuge impoundments throughout the spring and early summer. From September until the end of the year the flow continued into the refuge, but trans-^{evaporation} evaporation on the large water areas reduced the flow until none left Lake Tewaukon.

Plotting the water levels for all of the major bodies of water indicates two peaks of high water. The first occurring in March and April as a result of run-off. The second, and highest level, in June as a result of the above normal rainfall in May.

Lake Tewaukon was at or near spillway level throughout the year. Through August, some flow was recorded going over the spillway with maximum outflow occurring June, when the water level was eight inches above the spillway. Since August, there has been no flow from Lake Tewaukon. The structure which impounds the lake is in very bad condition and twice during the summer extensive repairs had to be made where the water had undermined it. An extensive algae bloom occurred on the lake during August and September, and though no fish or animal losses were noted, it produced an overpowering smell. Hence the vernacular name for the lake, "Skunk Lake".

Cutler's Marsh had the planned draw down during the fall of 1962. For the first two months of 1963 it remained about two feet below spillway level. With run-off water from the Wild Rice River, it filled to spillway level by the last week of March. It remained at slightly above the spillway level throughout the remainder of the year. Maximum outflow occurred in June when about 8 inches of water was going over the spillway. *

White Lake, which is connected by a vegetation filled channel to Cutler's Marsh, fluctuated much as the marsh. The high elevation for the year was reached during June and a low elevation during January. There is no control structure on the lake for manipulation of water levels. Clouds Lake remained below spillway level during the entire year. As with the other refuge lakes, the highest water level was reached in June. Since that time, the water level has dropped about a foot and a half.

Sprague and Bann Lakes do not have water gauges installed on them, but it is surmised that they fluctuated in the same pattern as the other refuge lakes. They both have held a good water level throughout the May-Dev. Pt and year. Emergent aquatic vegetation is beginning to appear in Sprague Lake.

* 6/3/63 MAX Q RIVER = 37 cfs

* 6/14/63 " " CAYUGA = 104 cfs

Fifty per cent of smaller wetlands, which are the critical areas in waterfowl production, had water after the spring run-off. The above normal May rains filled about 90% of the potholes, which in turn, attracted the second largest number of breeding pairs of ducks to the refuge. Below normal rainfall, since that time, has led to the drying of most of the type I and type III potholes. On a check made prior to freeze-up, only 6% of the potholes retained some water.

Food Supplies.

Overall aquatic food production was less than a year ago. The major water areas produced about the same as last year. Cutler's Marsh had moderate crop beds as did Mud Lake. Some crop production was also noted in Lake Tewaukon in spite of the abundance of Carp.

The small potholes produced far less food, than a year ago. Smartweed, which was abundant in all potholes in 1962, has almost disappeared this year. There was little or no water during the fall in most potholes and as a result, food that may have been produced there, went unutilized.

Waterfowl Use.

The combination of good aquatic food production and interspersion of emergent vegetation made Cutler's Marsh the most heavily utilized water area during spring and fall migration. Both duck and geese used the marsh. Considerable use was observed on Lake Tewaukon by Lesser Scaup and Mallards during the fall migration, but very few geese used the lake. White Lake had little waterfowl use. During the fall, an occasional flock of geese would rest on the area and some duck use was observed in the westend throughout the year.

Clouds' Lake was used only occasionally by ducks throughout the year. Use by geese increased during the fall as it became a resting and watering area. Hamm Lake received almost no waterfowl use during the year. It is felt to be a result of the lack of aquatic food and emergent vegetation. Sprague Lake received some use by ducks and geese during the fall.

The potholes held nearly all the ducks during the courtship, breeding, and nesting periods. These wetlands not only provide the isolation necessary for the above activities, but also, in large measure, provide food during the summer. After nesting is completed, many of the potholes dried-up and the broods moved to the larger water areas. Many of the larger brood marshes lie off the refuge. The potholes that had water during the fall, received fair to excellent utilization by the migrating ducks and geese.

Vegetation Control.

During the winter of 1962, while Cutler's Marsh was drawn down, strips of cattails were mowed. The creation of interspersion was short lived after the water was restored to normal level and little lasting effect can be seen. Some cattail mowing was also done on White Lake with the same result.

Eleven acres of cattails were sprayed with Amitrol "P" during August. Two strips were sprayed on the westend of White Lake and three strips in Cutler's Marsh. The kill appeared to be good and these areas will be watched this spring to determine kill more closely.

In an effort to create more edge effect and interdispersion in the small wetlands, strips were plowed through the dry potholes. Most of the plowed potholes are on the sample census area for broods and breeding pairs. There are several years records that show use of individual potholes, and we will attempt to compare undisturbed potholes to the plowed potholes; and evaluate this technique as a method to increase breeding pairs and hence production.

II. The 1964 Water Program.

The 1964 program is quite simple and is to keep all water areas at maximum level, as determined by precipitation and run-off.

It may be determined that a draw down is desirable during the fall on Cutler's Marsh and if this is the case, an amendment will be submitted.

It is conceivable that the construction of a new dam on Lake Tewaukon may begin in 1964, but it is doubtful that it will have any effect of water levels or water utilization.

To record water depth changes, it would be advisable to install gauges on Sprague and Menn Lake in 1964.

| Agree